

Appl. No. 09/745,104
Amdt. Dated 11/23/2004
Reply to Office Action of September 22, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1-4. (Cancelled).
5. (Currently Amended) A method for assembling an integrated circuit package, comprising:
 - applying a thermal epoxy to a top surface of an integrated circuit;
 - placing a thermal element adjacent to the thermal epoxy;
 - curing the thermal epoxy with energy at a microwave frequency without heating other components of the integrated circuit package, the curing of the thermal epoxy with the energy at the microwave frequency preventing (i) warpage of the integrated circuit package and (ii) epoxy pumping that would create air gaps between the thermal element and the integrated circuit; and
 - applying an encapsulant over the integrated circuit, the thermal element and the thermal epoxy after curing of the thermal epoxy.
6. (Previously Presented) The method of claim 5, further comprising mounting the integrated circuit to a substrate.
7. (Previously Presented) The method of claim 6, further comprising attaching a solder ball to the substrate.
8. (Previously Presented) The method of claim 6, wherein the applying of the encapsulant comprises molding the encapsulant onto the substrate and the integrated circuit.
9. (Currently Amended) A method for assembling an integrated circuit package, comprising:
 - applying a thermal epoxy to a thermal element, the thermal epoxy being an epoxy resin contain a thermally conductive filler;

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placing the thermal epoxy and the thermal element onto a top surface of an integrated circuit;

curing the thermal epoxy with energy at a microwave frequency without heating other components of the integrated circuit package, the curing of the thermal epoxy with the energy at the microwave frequency preventing (i) warpage of the integrated circuit package and (ii) epoxy pumping that would create air gaps between the thermal element and the integrated circuit; and

applying an encapsulant over the integrated circuit, the thermal element and the thermal epoxy after curing of the thermal epoxy to form the integrated circuit package.

10. (Previously Presented) The method of claim 9, further comprising mounting the integrated circuit to a substrate.

11. (Previously Presented) The method of claim 10, further comprising attaching a solder ball to the substrate.

12. (Previously Presented) The method of claim 10, wherein the applying of the encapsulant comprises molding the encapsulant onto the substrate and the integrated circuit.

13. (Original) The method of claim 5, wherein said thermal element is a heat spreader.

14. (Cancelled).

15. (Previously Presented) The method of claim 5, wherein said thermally conductive filler includes carbon particles.

16. (Original) The method of claim 5, wherein said placing of said thermal element includes attaching said thermal element to said epoxy.

17. (Previously Presented) The method of claim 5, wherein said curing of the epoxy includes

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selecting the microwave frequency to cure the thermal epoxy without damaging the integrated circuit or heating other components within the integrated circuit package; and
generating energy at the microwave frequency by a microwave generator directed toward the thermal epoxy.

18. (Previously Presented) The method of claim 9, wherein prior to applying said thermal epoxy to the thermal element, the method further comprises providing a thermally conductive filler to a resin to form said epoxy.

19. (Previously Presented) The method of claim 9 further comprising baking a substrate into which the integrated circuit is to be mounted before curing the thermal epoxy.

20. (Previously Presented) The method of claim 9, wherein said curing of the thermal epoxy includes

selecting the microwave frequency to cure the epoxy without damaging the integrated circuit or heating other components within the integrated circuit package; and
generating energy at the microwave frequency by a microwave generator directed toward the thermal epoxy.

21. (Previously Presented) The method of claim 6, wherein prior to curing the thermal epoxy, the method further comprising baking a substrate onto which the integrated circuit is to be mounted.

22. (Currently Amended) A method comprising:

applying a thermal epoxy to a thermal element;
mounting the thermal element on a top surface of an integrated circuit placed in an integrated circuit package mounted on a substrate, the thermal epoxy interposed between the thermal element and the integrated circuit;
baking the substrate along with the integrated circuit package, the thermal element and the thermal epoxy prior to curing the thermal epoxy;

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curing the thermal epoxy by radiating energy at a microwave frequency toward the thermal epoxy to cure the thermal epoxy without damaging the integrated circuit or heating other components of the integrated circuit package, the curing of the thermal epoxy by the radiating energy prevents (i) warpage of the integrated circuit package and (ii) epoxy pumping that would create air gaps between the thermal element and the integrated circuit.

23. (Previously Presented) The method of claim 22, wherein the epoxy is a thermal conductive filler with carbon particles.